FAST & UNDER TRAFFIC: CONCRETE OVERLAYS IN MICHIGAN

Unbonded Concrete overlays
Under traffic

Unbonded Overlays in Michigan

- **Highways**
  - I-96, Ionia County, 1984 (Switched)
    - *M-66 to Sunfield Rd., 7.5 in.*
  - US 23, Monroe County, 1984 (Switched)
    - *Ida Center Rd. to M-50, 8 in.*
  - US 10, Bay County, 1990 (With Traffic)
    - *Bay City to Midland, 7 in.*
  - I-96, Ionia County, 1991 (Switched)
    - *Ionia Co. to Bauer Rd., 7.5 in.*

Unbonded Overlays in Michigan

- **Highways (cont.)**
  - I-94, Jackson County, 1995 (Switched)
    - *Jackson Co. east 9.5 mi., 7.5 in.*
  - US 131, Allegan County, 1998 (With Traf.)
    - *Conrail RR to 114th Ave., 7.5 in.*
  - US 23, Livingston County, 1999(With Traf.)
    - Faucett Road to Genesee County Line, 8 in.
  - I-69, Branch County, 1999 (With Traf.)
    - I-94 to Eaton County Line, 7.5 in.

Unbonded Overlays in Michigan

- **Highways (cont.)**
  - I-69, Eaton County, 2000 (With Traf.)
    - *Eaton Co. Line to Island Hwy., 7.0 in.*
  - US 131, Kent County, 2000 (With Traf.)
    - M-46 north to Cannonsville Road., 7.0 in.
  - US 23, Livingston C, 2001 (With Traf.)
    - *north of I-96., 8.0 in.*

Unbonded Overlays in Michigan

- ***Local Roads & Streets***
  - *Coolidge Road, Royal Oak, 1983*
    - *13 Mile to 14 Mile, 5 in.*
  - *Enterprise Drive, Allen Park, 1997*
    - *Oak wood to S. Dearborn, 6”*
  - *Outer Drive, Dearborn Heights, 2000*
    - *Ford Road to Hines, 4”*

Unbonded Overlays in Michigan

- **US 10, Bay County, 1990**
  - *Bay City to Midland*

Length:	6.0 mi.
Contractor:	Interstate Hwy. Const.
Thickness:	7 in.
Joint Spacing:	15’ Random
Interlayer:	1 in. AC

U.S. 10 Concrete Overlay

- Westbound Concrete Overlay
  - 12 miles Completed in 11 Weeks
  - 14 days Ahead of Schedule
  - Incentive: $210,000 @ $15,000 per day
- Eastbound Rubblize & AC Overlay
  - 5 1/2 Months Completion Time

US 10 Overlay Today

- Asphalt at 10 years
  - Truck lane Micro surface at year 6
  - Mill and fill entire surface at year 9
- Concrete at 10 years
  - Section in good shape

Unbonded Overlays in Michigan

- **I-96, Ionia County, 1991**
  - *Ionia Co. Line to Bauer Rd.*

Length:	6.8 mi.
Contractor:	Ajax Paving
Thickness:	7.5 in.
Joint Spacing:	27’
Interlayer:	1 in. AC

Interstate I-96

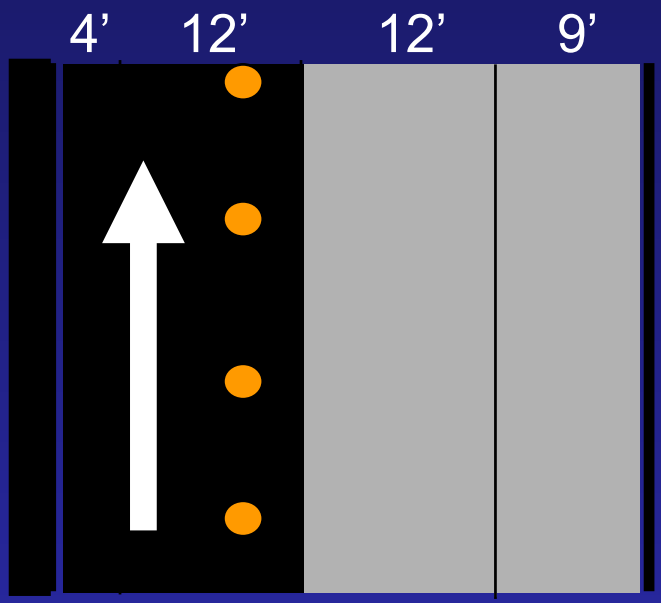
- **Concrete Overlay - 7.5”**
  - Clinton County, 1991
  - Cost: $1,034,000 per mile
  - Three months
- **Rubblize w/Asphalt Overlay - 6”**
  - Ingham County, 1992-93
  - Cost: $1,437,500 per mile
  - Two Seasons

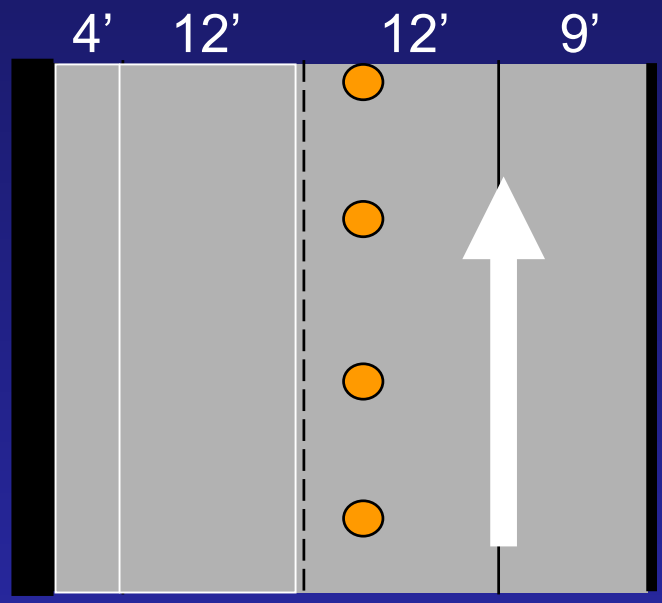
39% Difference in Initial Cost

US 131 Concrete Overlay

- 4.5 miles divided highway
- Concrete Overlay - All Lanes + Shoulders
- Completed in 44 days

Traffic Management





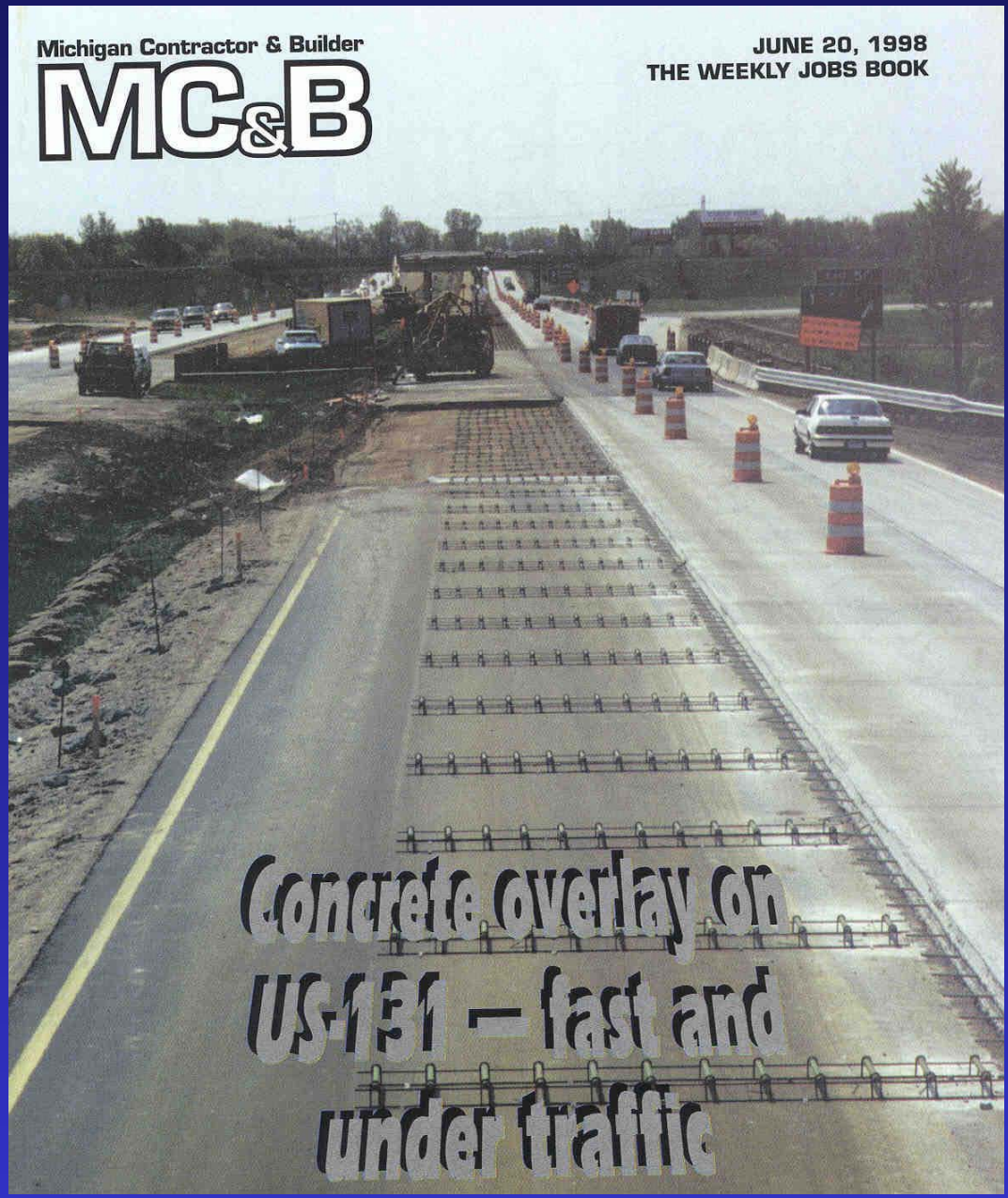
Stage I

- Prepare Shoulders
- Place AC Interlayer
- Take Outside Lane & Shoulder
- Pave Concrete Overlay
- Open to Traffic

Stage II

- Take Inside Lane & Shoulder
- Pave Concrete Overlay
- Open to Traffic

Michigan Contractor & Builder
MC&B
JUNE 20, 1998
THE WEEKLY JOBS BOOK



Concrete overlay on US-131 – fast and under traffic

1998 Bid Results

- **I-96 Asphalt Overlay**
  - 14.06 kilometers
  - Original Concrete 36 Yrs Old
  - 8-10 Year Fix
  - $14.52 Million - $1.03 Million/km

Overall Cost to Taxpayers

$103,000 per kilometer per year

1998 Bid Results

- **I-69 Rubblize/Asphalt Overlay**
  - 9.61 kilometers
  - Original Concrete 30 Yrs Old
  - **13** Year Fix
  - $11.4 Million (w/o Bridges) - $1.19 Million/km

Overall Cost to Taxpayers

$91,538 per kilometer per year

1998 Bid Results

- **US 131 Concrete Overlay**
  - 6.6 kilometers
  - Original Concrete 38 Years Old
  - $6.18 Million (w/o bridge) - $0.94 Million/k

Overall Cost to Taxpayers

$37,440 per kilometer per year

1998 Bid Results

Concrete Overlay

64% Savings vs Asphalt Overlay

59% Savings Over Rubblize/Asphalt

Concrete Lower Initial Cost

US 23 Concrete Overlay

I-69 Overlay

I-69 Overlay

MDOT's Current Traffic Management Plan for Overlays

- 11 Overlays in Michigan since 1984
  - All Projects … 2 Lane Freeways
  - 7 Under Traffic
    - All of the Last 6
    - Since LCCA used to select material
  - 4 Traffic Crossed Over (No Traffic)
    - Two way traffic on other side

Major Issues in Michigan

- Interferences between Traffic & Workers & Paving Equipment
- Stage Construction Occupying the same space with traffic
- Potential Traffic Rollover Problems
- Batch Truck Movements in and out of traffic
- Ride quality …. harder to obtain high numbers
- More conflicts between paving operation and traffic
- Much more time for traffic to get thru project (while paving)
- Basic safety concerns

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Interferences between Traffic & Workers & Paving Equipment (cont)

- Stage I pavement available to traffic is at the minimum (no more than 11ft)
- Drivers tend to give additional space to the construction operation and personnel
- Some Vehicles have dropped a wheel onto the 1ft gravel shoulder or beyond during stage I paving
  - Out of control incidents have occurred
    - Vehicles into ditch or overcorrecting onto work operation
    - No workers have been hit


BUMP

Interferences between Traffic & Workers & Paving Equipment

- Phase II Construction Operation
  - Traffic is compressed to edge of the slab for entire length of project
    - To provide room for all construction operations that take place to the side (both at the paver and behind the paver)
    - Paver, Float Operator, Clean Up Crew, Inspection Personnel

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MOTS

Interferences between Traffic & Workers & Paving Equipment (cont)

- Stage I Construction Operation
  - Median widened by 4ft
  - Less lateral space available during this operation
  - Same construction operations as stage II
  - Float operator, inspector, and paver crew still needs to fit within the new edge of slab and the white edge line
  - Note float man watching for traffic to extend float

Rollover Problems (cont)

- Factors
  - Vehicle Traffic is confined to outer edge
  - Potential Soft Shoulder exists at edge
  - Motorists may not be aware of shoulder situation
  - Height of overlay adds to steepness of the pre-existing sideslope
  - Stage I tight available space for construction operations places construction personnel uncomfortably close to the vehicle stream

Rollover Problems (cont)

- Corrections on future projects
  - Additional outside width of paved temporary shoulders
  - Vertical panels placed off the edge of temp shoulder to mark the drop off
  - Calcium Chloride treated shoulders to improve stability during runoff event
    - Other treatments possible (Cement /Lime/ Other)


5. 2. 2001 09:40


5. 2. 2001 09 : 41


5. 2. 2001 09:03


RED RIVER
5. 2. 2001 09:05


5. 2. 2001 09:48


5. 2. 2001 09:06

Next Steps for MDOT

- Debated internally at MDOT & FHWA (Nothing official)
- Take a hard look at present issues and try to solve them without getting rid of the concept of paving under traffic.
- Addition of other innovations such as warranties and alternative bids may have some effect on the outcome.

Bottom Line - Maintain the Overall System Health

- # 1. Use sound engineering Logic to choose the correct fix.
- #2. Then and only then - look at traffic impact.

The Customer is Speaking

Are We Listening?

EPIC-MRA Statewide Poll

Purpose

To assess general public attitude about lane closures for road construction

How often have you encountered construction zones in the last year?

- 31% Every time you drive
- 34% Almost all the time
- 23% About 50% of the time
- 9% Not very often
- 1% Never
- 2% Undecided/Don't know

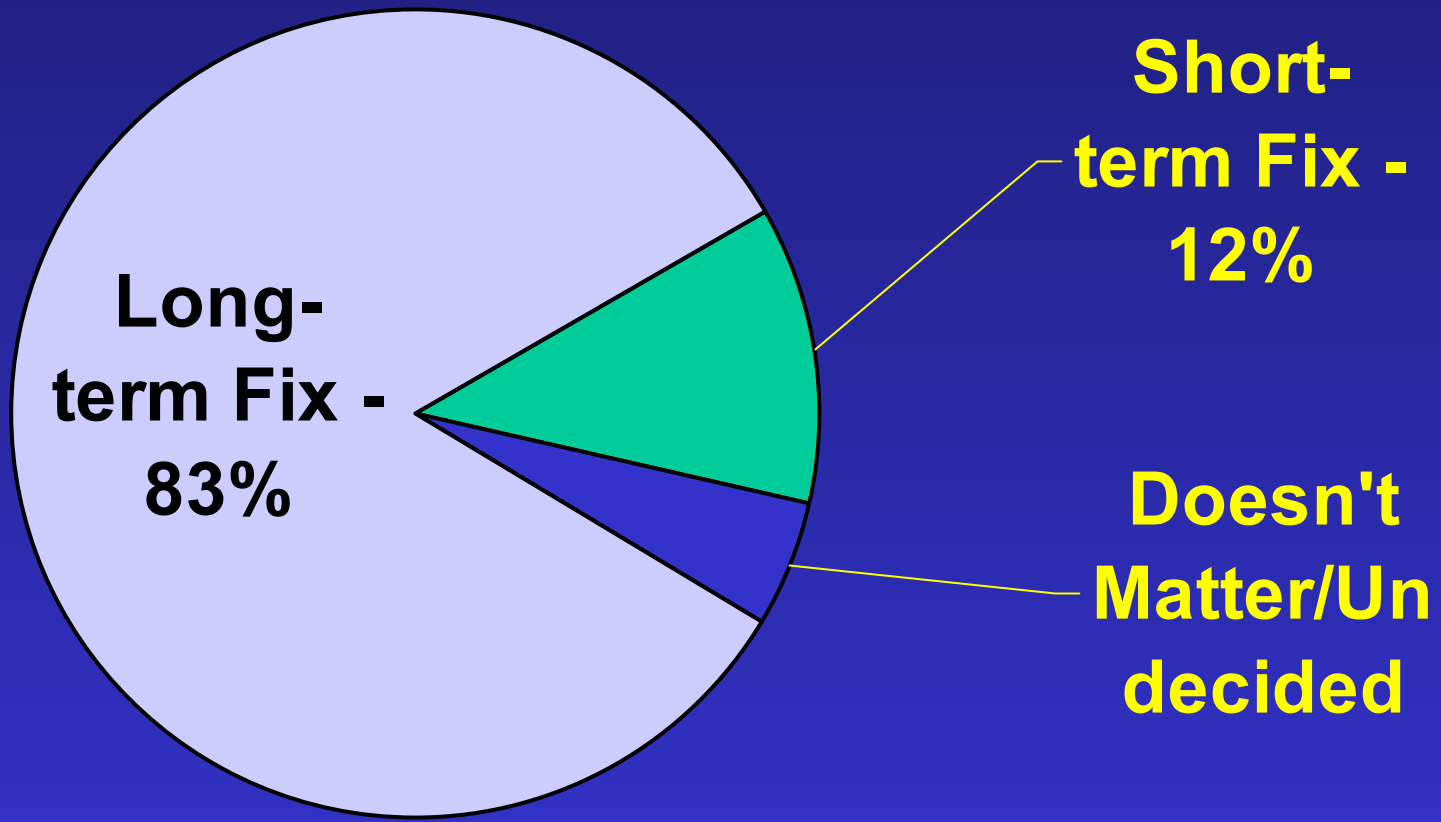
88% at Least 1/2 Time

Definitions

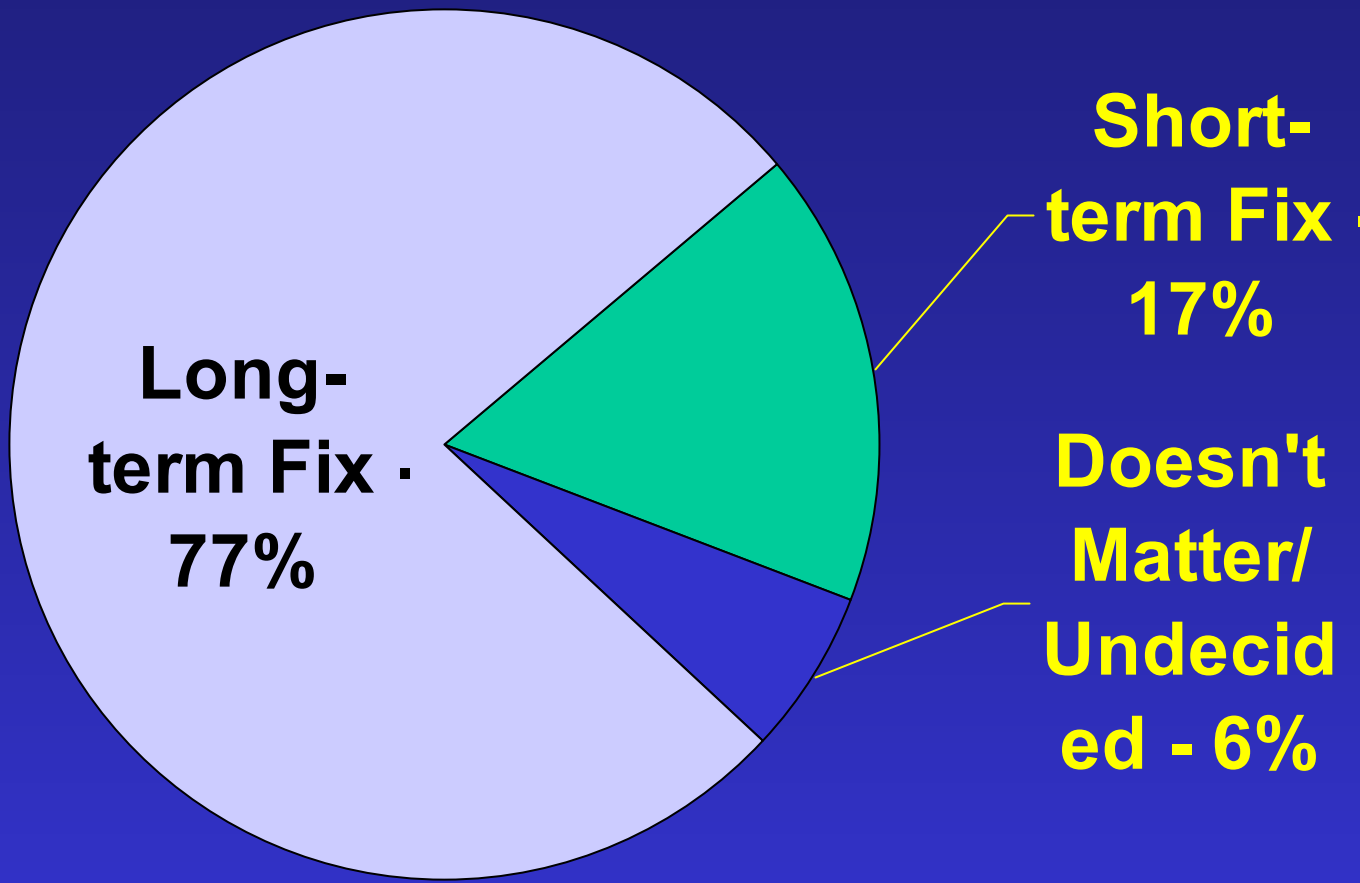
- Long-term Fix
  - Lasts 30-35 years
  - Costs more initially
  - 2-3 months of lane closures
- Short-term Fix
  - Lasts 8-10 years
  - Costs less initially
  - Minimal delays in daytime hours

RESULTS

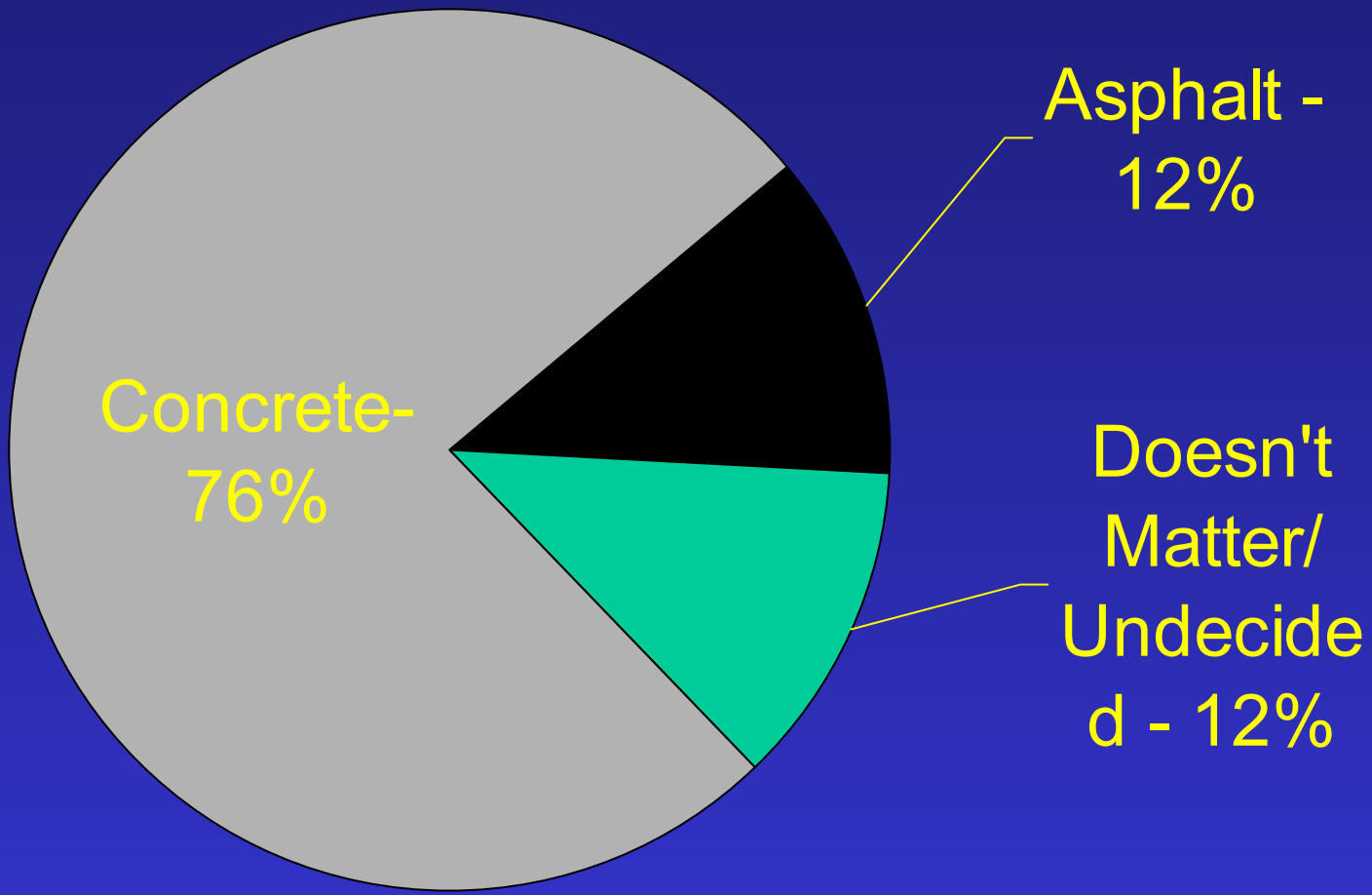
Long-term Fix (30-35 yrs) vs Short-term Fix (8-10 yrs)



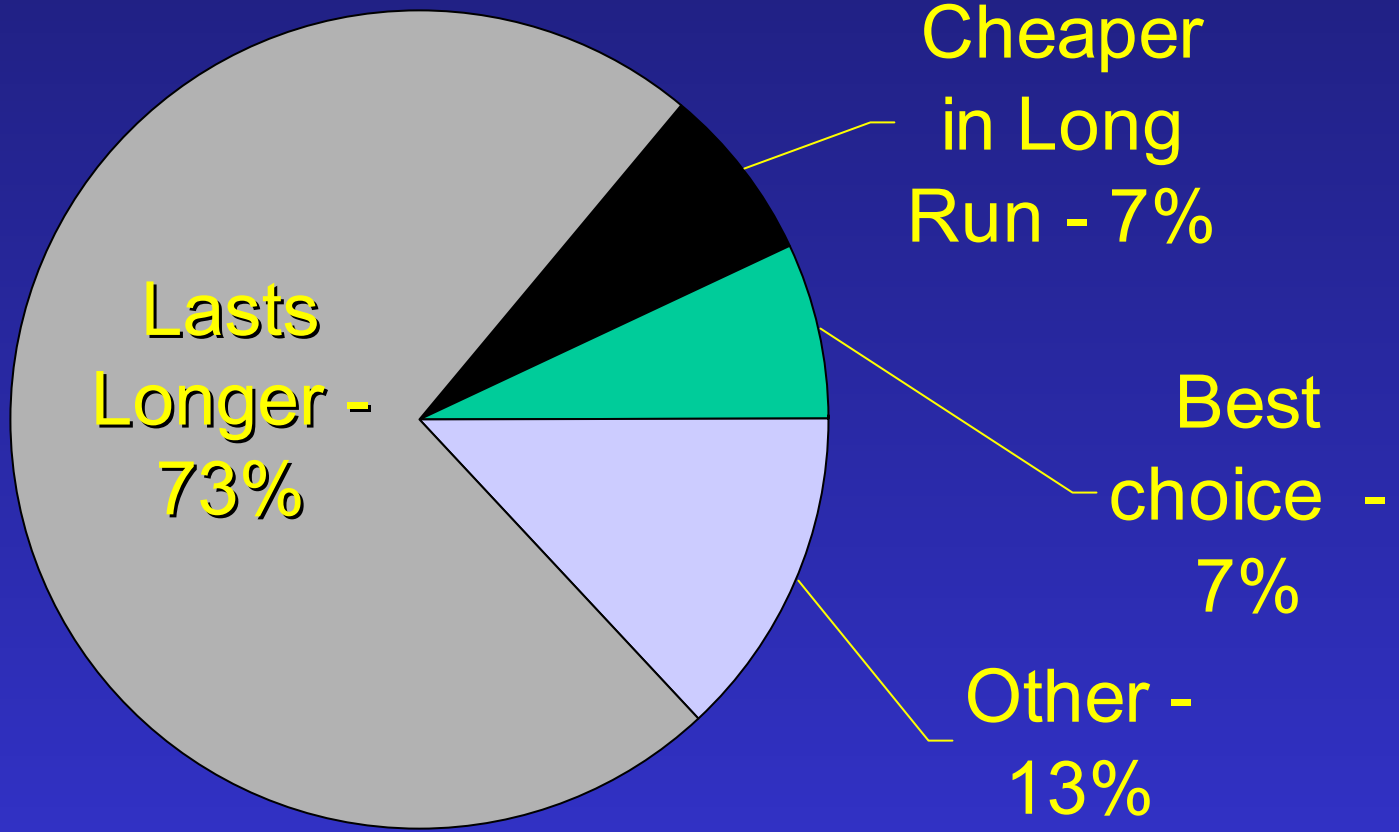
Long-term Fix (2-3 mo. closure) vs Short-term Fix (minimal closure)



Which Do You Prefer?



Why Did You Choose Concrete?



Minimizing Motorist Impact

Get In,

Do It Right,

Get Out,

Stay Out

THANK YOU!

MICHIGAN CONCRETE PAVING ASSOCIATION